



SLOVENSKI STANDARD

SIST EN 61083-2:1998

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Digital recorders for measurements in high- voltage impulse tests - Part 2: Evaluation of software used for the determination of the parameters of impulse waveforms (IEC 61083-2:1996)

Digital recorders for measurements in high-voltage impulse tests -- Part 2: Evaluation of software used for the determination of the parameters of impulse waveforms

Digitalrecorder für Stoßspannungs- und Stoßstromprüfungen -- Teil 2: Bewertung von Software zur Bestimmung der Parameter von Stoßspannungen

Enregistreurs numériques pour les mesures pendant les essais de choc à haute tension -- Partie 2: Evaluation du logiciel utilise pour obtenir les paramètres des formes d'onde de choc

Ta slovenski standard je istoveten z: EN 61083-2:1997

ICS:

17.220.20	Merjenje električnih in magnetnih veličin	Measurement of electrical and magnetic quantities
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ICS 17.220.20

Descriptors: Digital recorders, high-voltage impulse tests, software, impulse waveforms

English version

**Digital recorders for measurements in high-voltage impulse tests
Part 2: Evaluation of software used for the determination
of the parameters of impulse waveforms
(IEC 1083-2:1996)**

Enregistreurs numériques pour les
mesures pendant les essais de choc
à haute tension
Partie 2: Evaluation du logiciel utilisé
pour obtenir les paramètres des formes
d'onde de choc
(CEI 1083-2:1996)

Digitalrecorder für Stoßspannungs-
und Stoßstromprüfungen
Teil 2: Bewertung der Software zur
Parameterbestimmung von
Stoßspannungen und -strömen
(IEC 1083-2:1996)

This European Standard was approved by CENELEC on 1996-12-09. CENELEC members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration.

Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Central Secretariat or to any CENELEC member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CENELEC member into its own language and notified to the Central Secretariat has the same status as the official versions.

CENELEC members are the national electrotechnical committees of Austria, Belgium, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and United Kingdom.

CENELEC

European Committee for Electrotechnical Standardization
Comité Européen de Normalisation Electrotechnique
Europäisches Komitee für Elektrotechnische Normung

Central Secretariat: rue de Stassart 35, B - 1050 Brussels

Foreword

The text of document 42/123/FDIS, future edition 1 of IEC 1083-2, prepared by IEC TC 42, High-voltage testing techniques, was submitted to the IEC-CENELEC parallel vote and was approved by CENELEC as EN 61083-2 on 1996-12-09.

The following dates were fixed:

- latest date by which the EN has to be implemented at national level by publication of an identical national standard or by endorsement (dop) 1997-09-01
- latest date by which the national standards conflicting with the EN have to be withdrawn (dow) 1997-09-01

Annexes designated "normative" are part of the body of the standard.
Annexes designated "informative" are given for information only.
In this standard, annex ZA is normative and annexes A, B and C are informative.
Annex ZA has been added by CENELEC.

Endorsement notice

The text of the International Standard IEC 1083-2:1996 was approved by CENELEC as a European Standard without any modification.

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Annex ZA (normative)

**Normative references to international publications
with their corresponding European publications**

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

NOTE: When an international publication has been modified by common modifications, indicated by (mod), the relevant EN/HD applies.

<u>Publication</u>	<u>Year</u>	<u>Title</u>	<u>EN/HD</u>	<u>Year</u>
IEC 60-1	1989	High-voltage test techniques Part 1: General definitions and test requirements	HD 588.1 S1 ¹⁾	1991
IEC 60-2	1994	Part 2: Measuring systems	EN 60060-2	1994
IEC 1083-1 (mod)	1991	Digital recorders for measurements in high-voltage impulse tests Part 1: Requirements for digital recorders	EN 61083-1	1993

1) HD 588.1 S1 includes corrigendum March 1990 to IEC 60-1.

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INTERNATIONALE
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1083-2

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First edition
1996-07

**Enregistreurs numériques pour les mesures
pendant les essais de choc à haute tension –**

**Partie 2:
Evaluation du logiciel utilisé pour obtenir
les paramètres des formes d'onde de choc**

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**Digital recorders for measurements
in high-voltage impulse tests –**

Part 2:

**Evaluation of software used for the determination
of the parameters of impulse waveforms**

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INTERNATIONAL ELECTROTECHNICAL COMMISSION

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**DIGITAL RECORDERS FOR MEASUREMENTS IN
HIGH-VOLTAGE IMPULSE TESTS –**
**Part 2: Evaluation of software used for the determination of
the parameters of impulse waveforms**

FOREWORD

- 1) The IEC (International Electrotechnical Commission) is a worldwide organization for standardization comprising all national electrotechnical committees (IEC National Committees). The object of the IEC is to promote international co-operation on all questions concerning standardization in the electrical and electronic fields. To this end and in addition to other activities, the IEC publishes International Standards. Their preparation is entrusted to technical committees; any IEC National Committee interested in the subject dealt with may participate in this preparatory work. International, governmental and non-governmental organizations liaising with the IEC also participate in this preparation. The IEC collaborates closely with the International Organization for Standardization (ISO) in accordance with conditions determined by agreement between the two organizations.
- 2) The formal decisions or agreements of the IEC on technical matters, express as nearly as possible, an international consensus of opinion on the relevant subjects since each technical committee has representation from all interested National Committees.
- 3) The documents produced have the form of recommendations for international use and are published in the form of standards, technical reports or guides and they are accepted by the National Committees in that sense.
- 4) In order to promote international unification, IEC National Committees undertake to apply IEC International Standards transparently to the maximum extent possible in their national and regional standards. Any divergence between the IEC Standard and the corresponding national or regional standard shall be clearly indicated in the latter.
- 5) The IEC provides no marking procedure to indicate its approval and cannot be rendered responsible for any equipment declared to be in conformity with one of its standards.
- 6) Attention is drawn to the possibility that some of the elements of this International Standard may be the subject of patent rights. IEC shall not be held responsible for identifying any or all such patent rights.

International Standard IEC 1083-2 has been prepared by IEC technical committee 42: High-voltage testing techniques.

The text of this standard is based on the following documents:

FDIS	Report on voting
42/123/FDIS	42/132/RVD

Full information on the voting for the approval of this standard can be found in the report on voting indicated in the above table.

Annexes A, B and C are for information only.

INTRODUCTION

IEC 1083-1 specifies the test requirements for digital recorders. Digital recorders, like analog oscilloscopes, are susceptible to changes of their characteristics. However, the more stringent testing specified for digital recorders (more than is practical for analog oscilloscopes) has led to the accuracy of digital recorders being more clearly demonstrated.

The method of processing a digital record is left to the parties concerned in the test; the only condition specified is that the raw data are retained for comparison with the processed data. However, since the parameters of the test impulse (including the test value) may be read from the processed data, it is important to establish tests to ensure that the reading of parameters is adequately performed. The problem is how to ensure this, while permitting users to develop a wide range of techniques which may give greater accuracy.

This problem is further complicated by the different needs of various users, ranging from single-purpose test laboratories, for example a cable manufacturer who may only test a few objects which are capacitive, to large high-voltage test/research laboratories, which may perform tests on a very wide range of objects, which have a correspondingly wide range of impedances.

The approach taken in this part of IEC 1083 is to provide from a floppy disk waveforms (and ranges of their parameters), which a user can employ to verify that a procedure gives values within the specified ranges. To reduce the amount of testing required the waveforms are divided into groups (see table 1), and the user need only check those groups which are appropriate for the high-voltage tests to be performed in his laboratory.

The detailed studies of methods for the evaluation of parameters has revealed (or emphasized) some fundamental problems with the definitions of some parameters. The use of digital techniques provides an opportunity to improve the definition of some parameters, such as time-to-peak, and the classification of overshoot and oscillations. These matters are still under consideration.

DIGITAL RECORDERS FOR MEASUREMENTS IN HIGH-VOLTAGE IMPULSE TESTS –

Part 2: Evaluation of software used for the determination of the parameters of impulse waveforms

1 Scope

This part of IEC 1083 is applicable to the processing of records taken by digital recorders used for measurements during tests with high-voltage impulses and high current impulses as specified in IEC 60. It specifies the test procedures to be applied to assess the accuracy of software used to process and read the records of impulses and calibration signals.

This part:

- defines the terms specifically related to digital processing;
- establishes the tests which are necessary to show that software is compatible with the requirements of IEC 60-1 and IEC 1083-1;
- specifies limits on estimates of the values of parameters of the reference waveforms;
- gives the requirements for the record of performance.

NOTE – For waveforms not specified in IEC 60, for example waveforms accepted in tests of transformers and arresters, it is recommended to evaluate the impulse parameters from the raw data in the traditional way prescribed by the relevant technical committee.

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2 Normative references

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The following normative documents contain provisions which, through reference in this text, constitute provisions of this part of IEC 1083. At the time of publication, the editions indicated were valid. All normative documents are subject to revision, and parties to agreements based on this part of IEC 1083 are encouraged to investigate the possibility of applying the most recent editions of the normative documents indicated below. Members of IEC and ISO maintain registers of currently valid International Standards.

IEC 60-1: 1989, *High-voltage test techniques – Part 1: General definitions and test requirements*

IEC 60-2: 1994, *High-voltage test techniques – Part 2: Measuring systems*

IEC 1083-1: 1991, *Digital recorders for measurements in high-voltage impulse tests – Part 1: Requirements for digital recorders*

3 Definitions

For the purposes of this part of IEC 1083, the following definitions apply.

3.1 Terms defined in the referenced subclauses of IEC 1083-1

- output of a digital recorder 1.4.2
- full-scale deflection 1.4.7
- average code bin width 1.4.9
- sampling rate 1.4.12
- record length 1.4.14
- rated resolution 1.4.6
- internal noise level 2.2.3

3.2 **offset:** Output for zero input.

3.3 **raw data:** Original record of sampled and quantized information obtained when a digital recorder converts an analog signal into digital form.

The correction of the output for offset to give a zero-based record is permitted, as is multiplying the record by a constant scale factor. Records processed in this way are still considered as raw data.

NOTES

- 1 This information may be made available in binary, octal, hexadecimal or decimal form.
- 2 Raw data are available from most digital recorders, but not from all.

3.4 **processed data:** Data obtained by any processing (other than correction for offset and/or multiplying by a constant scale factor) of the raw data.

NOTE – Automatically processed data are not covered by IEC 1083-1 nor by this standard (see clause 9).

3.5 **reference waveform:** Waveform supplied by the test data generator (TDG) for testing software.

3.6 **trigger delay:** Elapsed time from the occurrence of a trigger event to the time at which a specified data sample is recorded.

NOTES

- 1 Delayed mode: the specified data sample is the first sample in the record.
- 2 Pre-trigger mode: the specified sample is selected part of the way through the record.
- 3 In the TDG, the time scale origin is set equal to the instant of trigger and the pre-trigger amount is specified as a percentage of the record.